



# Halls Flat Windthrow Project

## Environmental Assessment



Forest Service

Lassen National Forests

Hat Creek Ranger District July 2016

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# Contents

Halls Flat Windthrow Project .....	i
Environmental Assessment.....	i
Chapter 1: Purpose, Need, and Proposed Action.....	1
Introduction.....	1
Location of the Proposed Project Area .....	1
Need for the Proposal.....	3
Public Involvement .....	4
Scoping.....	4
Issues Analysis and Alternative Development.....	5
Alternatives Considered But Eliminated From Detailed Study .....	5
What will be Decided? .....	6
Chapter 2: Alternatives .....	6
Alternative 1 - Proposed Action.....	7
Alternative 2 – No Action .....	12
Chapter 3: Environmental Consequences .....	12
Socioeconomics .....	13
Direct and Indirect Effects to Socioeconomics .....	13
Cumulative Effects to Socioeconomics .....	13
Fire and Fuels.....	14
Direct and Indirect Effects to Fire and Fuels.....	14
Cumulative Effects to Fire and Fuels .....	16
Terrestrial and Aquatic Threatened, Endangered, Sensitive (TES) and MIS Species .....	17
Direct and Indirect Effects to Terrestrial TES Wildlife Species .....	17
Cumulative Effects to Terrestrial TES Wildlife Species .....	21
Determination of Effects .....	22
Sensitive and Listed (TES) Aquatics Species.....	22
Management Indicator Species (MIS).....	23
Cumulative Effects to MIS .....	24
Botanical Resources .....	25
Direct and Indirect and Cumulative Effects to Botanical Resources .....	25

Determination of Effects .....	25
Hydrology .....	25
Direct and Indirect Effects to Hydrology .....	25
Cumulative Effects to Hydrology .....	26
Soils.....	27
Direct and Indirect Effects to Soils.....	27
Cumulative Effects to Soils .....	28
Cultural Resources .....	29
Direct and Indirect Effects to Cultural Resources .....	29
Cumulative Effects to Cultural Resources.....	29
Agencies and Persons Consulted .....	29
References .....	31

# **Chapter 1: Purpose, Need, and Proposed Action**

## **Introduction**

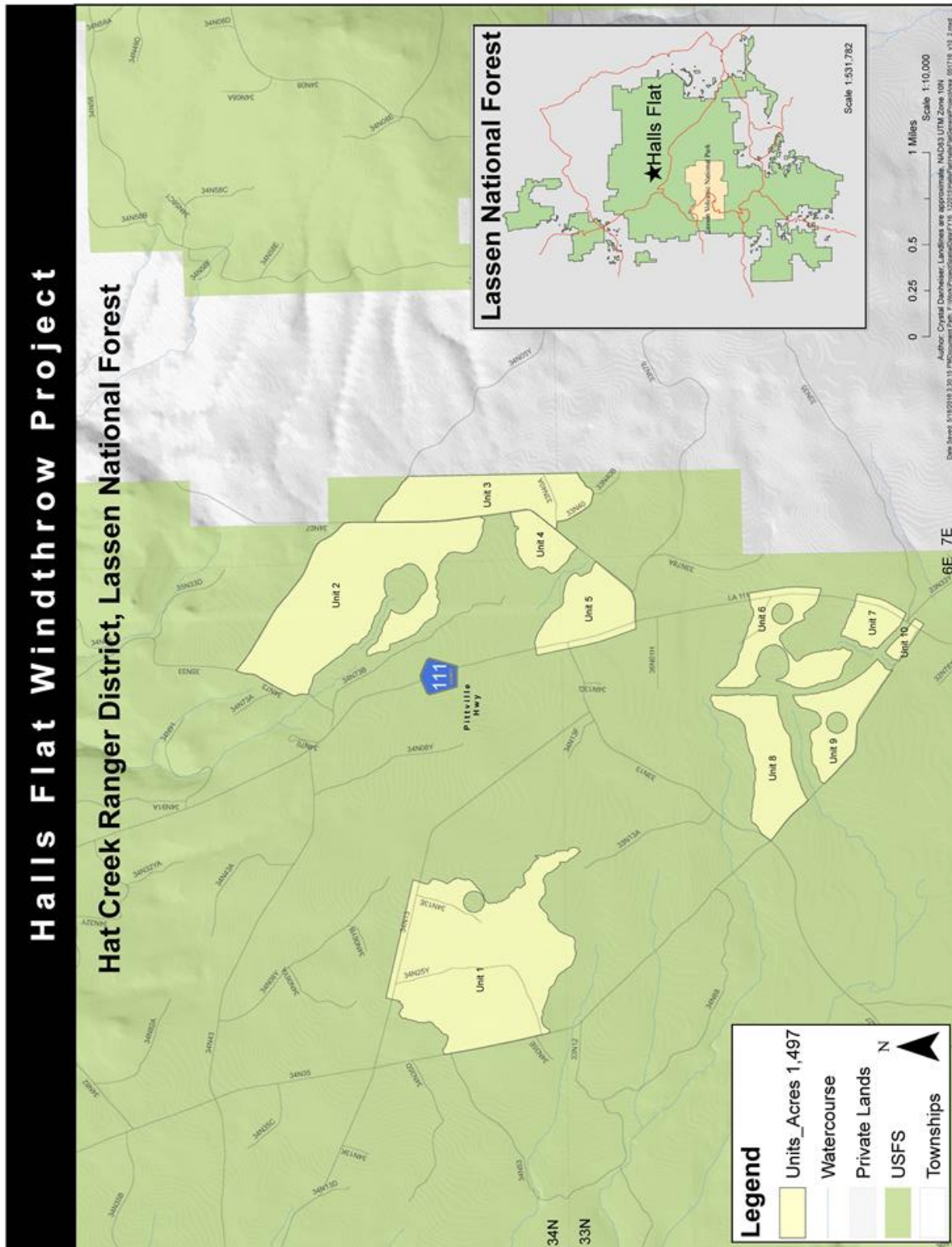
On the evening of February 6, 2015 a wind storm passed through the area of the Lassen National Forest, resulting in over 12,000 acres of windthrown trees. After the wind event, the Forest Service identified roughly 1,497 acres within the Halls Flat vicinity that would be recoverable through the use of a timber sale.

The Forest Service is proposing to salvage windthrown trees on National Forest System lands on 1,497 acres of the Hat Creek Ranger District of the Lassen National Forest.

We prepared this environmental assessment to determine whether effects of the proposed activities may be significant enough to prepare an environmental impact statement. By preparing this environmental assessment, we are fulfilling agency policy and direction to comply with the National Environmental Policy Act (NEPA) and other relevant Federal and State laws and regulations. For more details of the proposed action, see the “Proposed Action and Alternatives” section of this document on p. 7.

## **Location of the Proposed Project Area**

The project area is located north of California Hwy 44, residing along both the east and west sides of the Pittville Highway, also known as County Road 111 (See map attached). Legal locations for the Halls Flat Windthrow Project include portions of Township (T) 33 and 34 North (N), Range (R) 6 East (E), Sections 1-2 and 11-13; R7E, Section 6; T34N, R6E, Sections 25, 27, and 34-36; and R7E, Sections 30-31, in Lassen County, California.



Map 1. Vicinity map



## Need for the Proposal

The purpose of the project is to provide timely salvage of windthrown trees in order to recover the economic value of material and remove hazardous fuel accumulation from the wind event of February 6<sup>th</sup>, 2015. The need arises from the diminishing merchantability of the down timber and accumulations of fuels within proposed units, as well as the need to maintain existing desired fire protection zones (DFPZs) from hazardous standing dead and root-sprung trees (live trees that have been uprooted) along road corridors. Economic timber value of windthrown trees is short lived and will continue to decline over time. The Forest Service's goals, objectives, and standards and guidelines within 1992 Lassen National Forest Land and Resource Management Plan (LRMP) and subsequent amendments provide further direction for removal of trees (See Management Direction section below).

### Management Direction

Under the Multiple-Use Sustained-Yield Act of 1960, as amended (74 Stat. 215; 16 USC 528-531) and the Forest and Rangeland Renewable Resource Planning Act of 1974, as amended [88 Stat. 476; as amended by the National Forest Management Act of 1976 (16 USC 1600-1614)], the Forest Service is authorized to sell timber and reforest National Forest System lands.

The proposed treatment area contains DFPZs created under the Herger-Feinstein Quincy Library Group (HF-QLG) Forest Recovery Act of 1999. DFPZs are strategically located strips of land, usually along roads, ridgetops, or meadows, on which fuels have been modified to reduce the potential for crown fire. Some previously treated areas have been included within DFPZs. DFPZs also provide fire suppression personnel with a safer location from which to take action against wildfire. Lower fuel loads must be maintained in DFPZs to keep their effectiveness over time.

The desired conditions for the project area are guided by the direction contained in the 1992 Lassen National Forest Land and Resource Management Plan (LRMP) and 1993 Record of Decision (ROD), as amended by the 2004 Sierra Nevada Forest Plan Amendment (SNFPA) Final Supplemental Environmental Impact Statement (FSEIS) and Record of Decision (ROD), and the 2007 SNFP Management Indicator Species Amendment. These documents are herein referred to as the "Forest Plan". The Halls Flat Windthrow project is designed to be consistent with the desired conditions described in the Forest Plan.

The Forest Plan provides for ecosystem restoration following large, catastrophic disturbance events. Restoration activities may be conducted and include objectives for managing disturbed areas for long-term fuel profiles and recovering the economic value of some dead and dying trees. Restoration projects can include salvage of dead and dying trees for economic value, as well as for fuels reduction (SNFPA ROD, pp. 4 and 6).

In compliance with the Code of Federal Regulations [36 CFR 220.7(b)(1) and 40 CFR 1508.9(b)], this section describes the need for the project. The need for this project is:

#### **To recover the economic value of windthrown trees.**

Timely capture of the economic value of windthrown trees through removal is critical to achieve the desired conditions of benefits to local communities and forest management. The value of

these trees is short lived, and will continue to decline over time, as the diameter size necessary for a tree to have economic value increases over time.

In the short-term, there is a financial incentive for private companies to remove windthrown trees, but as time passes and the trees deteriorate, that incentive decreases because the removal costs become more than the value in the timber. Substantial loss of economic value to the Federal Government from deterioration of the windthrown trees occurs as implementation is delayed. Timing of implementation is critical to capture the window of opportunity for recouping enough value from the material removed to pay for its way out of the woods. Delaying for even one operating season would potentially diminish the economic value to a point of jeopardizing recovery of any economic value at all. Deterioration increases quickly with time which drastically reduces merchantable volume, lumber quality, and value.

The communities of the Hat Creek Valley, Burney Basin, and Fall River Valley, all in close proximity to the Halls Flat area, are supported by an active timber industry and wood products infrastructure. There are two active sawmills in Burney. A viable timber industry and wood products infrastructure greatly improves the ability to treat and manage forest vegetation in a cost-effective and efficient manner, while ensuring long-term local employment.

**To remove hazardous fuel accumulation.**

The wind event blew over many trees, creating a new component of large down woody material on the forest floor, as well as root-sprung trees. Further, these root-sprung trees will in time fall to the forest floor, adding to the accumulation of surface fuels. Reduction of the accumulation of surface fuels maintains the intent of the established DFPZs and minimizes the amount of large woody material within the forest matrix.

## Public Involvement

The project was listed in the Lassen National Forest Schedule of Proposed Actions (SOPA) in January and April 2016.

## Scoping

Scoping for this project was initiated on March 16, 2016. Scoping information packets were made available to the public. Letters were sent to adjacent landowners, Shasta and Lassen County Boards of Supervisors, the Lassen County, Hat Creek Valley, and Shasta County Fire Safe Councils, the Central Valley Regional Water Quality Control Board, the Lahontan Regional Water Quality Control Board, California Department of Forestry and Fire Protection, California Department of Fish and Wildlife the Natural Resource Conservation Service, Lassen Forest Preservation Group, and Sierra Forest Legacy. The Pit River Tribe, Greenville Rancheria, and Susanville Indian Rancheria also received this information packet.

Six individuals/organizations responded in writing. All suggested changes to elements of the proposed action received from the public were considered. The analysis of the public comments is contained in the document titled “Halls Flat Project Scoping Comments / Disposition of Comments” (located in the Halls Flat Windthrow Project Record, Hat Creek Ranger District office).



## Issues Analysis and Alternative Development

The Forest Service considered all potential issues (point of discussion, debate, or dispute). Non-issues were defined as : 1) outside the scope of the proposed action; 2) already decided by law, regulation, Forest Plan, or other higher level decision; 3) irrelevant to the decision to be made; or 4) conjectural and not supported by scientific or factual evidence. The Code of Federal Regulations (40 CFR Part 1501.7(3)) of The Council on Environmental Quality's (CEQ) NEPA regulations requires us to: "Identify and eliminate from detailed study the issues which are not significant or which have been covered by prior environmental review."

## Alternatives Considered But Eliminated From Detailed Study

NEPA requires that Federal agencies rigorously explore and objectively evaluate all reasonable alternatives and briefly discuss the reasons for eliminating any alternatives that were not developed in detail (40 CFR 1502.14). Alternatives suggested during the scoping process were considered. Alternatives not considered in detail may include, but are not limited to, those that fail to meet the purpose and need, are technologically infeasible or illegal, or would result in unreasonable environmental harm. Descriptions of all alternatives considered from scoping and the reasons for their elimination from detailed study are contained in the Halls Flat Windthrow Project Public Scoping Issue Analysis and Alternative Development (Halls Flat Windthrow Project Record). The following alternatives are based on scoping comments and were considered but dismissed from detailed consideration for reasons summarized below.

### **Salvage Including Roadside Hazard Tree Units**

This alternative would include both the salvage units identified in the current proposed action, as well as the additional acreage within roadside hazard tree units identified in the proposed action provided for public scoping. Roadside hazard units were identified along Forest Road 34N13 and a portion of LA 111 (Pitville Highway).

This alternative was considered, but eliminated from detailed study as a result of public comment questioning the hazard posed by downed windthrown material along roadside units. Further field verification indicated that much of the material within these roadside units beyond the new adjusted units has actually fallen fully down and does not pose an increased threat to road travelers. Therefore, the need for removal along the originally proposed distance of roadside hazard units was reconsidered and the proposed action was adjusted to remove these separate units.

### **Roadside Hazard Tree Only**

This alternative would only cut and remove hazard trees along Forest Road 34N13 and a portion of LA 111 (Pitville Highway); all other windthrown trees in the project area would remain.

This alternative was considered, but eliminated from detailed study because this alternative does not meet the need to recover the economic value of windthrown trees. Most of the marketable timber would be left on site and not harvested. This would result in very little economic return for the local economy. Also, this alternative does not meet the need to reduce surface fuel loads to levels which minimize the danger and difficulty of suppressing future wildfires, and enhance future forest resiliency. Down woody material would continue to accumulate at a rate that is

greater than decomposition, contributing to the surface fuel layer. Increased surface loads would result in increased flame lengths, fire line intensities, and resistance-to-control problems thus leading to increased firefighter risk.

## What will be Decided?

The need for the proposal outlined earlier sets the scope of the project and analysis to be completed. Based on the analysis, the forest supervisor will determine whether the proposed project and alternatives could result in a significant impact. If there is a finding of no significant impact, the forest supervisor will select an alternative deciding:

1. Whether to implement salvage of windthrown trees
2. What specific design criteria or mitigation measures are needed;
3. What specific project monitoring requirements are needed to assure design criteria and mitigation measures are implemented and effective.

The decision will be based on:

1. How well the selected alternative achieves the need,
2. How well the selected alternative protects the environment and addresses issues and concerns, and
3. How well the selected alternative complies with relevant policies, laws and regulations.

The decision will include a non-significant Forest Plan Amendment (FPA) for a deviation from the current LNF LRMP Standards and Guidelines for project implementation within the Negro Camp Gulch and Upper Beaver Creek HUC-12 watersheds, which are currently over the Threshold of Concern (TOC) (see hydrology specialist report for definition/discussion) due to the large size of moderate-to-high soil burn severity resulting from the Bald Fire in 2014, which occurred outside of the project area. Currently, both watersheds are over the allowable TOC, even without post fire management activities. The Lassen LRMP directs the forest to adjust project impacts and/or timing to keep disturbance below the TOC in all affected watersheds (LRMP, page 4-32). However, modifying the timing of the activities is not a viable option due to the urgent nature of the situation. Salvage activities need to begin immediately to recover economic value of the affected timber. Loss of viable timber sales jeopardizes restoration and recovery objectives, such as fuels reduction.

A non-significant, site specific FPA would be necessary to meet management direction and permit project actions to occur.

## Chapter 2: Alternatives

This chapter describes and compares the alternatives. This chapter also details the design features and management requirements. The intent of these features and requirements is to protect resources and ensure that the Action Alternatives are consistent with the Forest Plan standards and guidelines. Design features that would be implemented are considered part of the proposed

actions. Finally, this Chapter displays the alternatives in comparative form, defining the differences between them and providing a basis for a choice among the options by the Responsible Official.

## Alternative 1 - Proposed Action

The Forest Service proposes to salvage windthrown trees within the Halls Flat project area, which consists of approximately 1,497 acres on National Forest System lands. Salvage would be accomplished through utilization of ground-based logging equipment, favoring the use of low-impact harvest techniques.

Salvage activities would comprise of removal of windthrown material on approximately 1,497 acres. The harvest units were identified based upon concentrations of downed merchantable material, excluding wet meadows, Riparian Conservation Areas (RCA), and the Black Mountain Experimental Forest. Trees would be marked according to the standards of the Lassen LRMP, to provide a minimum of 1.5 down logs per acre, with emphasis on retention of down woody material in the largest size class and decay classes 1 and 2. Snags, root-sprung trees and down woody material would be left for wildlife habitat, beyond those hazard standing dead and root-sprung trees along roadways marked using the “Hazard Tree Guidelines for Forest Service Facilities and Roads in the Pacific Southwest Region” (Report No. RO-12-01). Thus, these hazard trees would be removed up to 200 feet from either side of the roads adjacent to units, depending upon the hazard rating of 5 or greater, as described in the Report No. RO-12-01. Due to the dispersed nature of the harvestable material and the use of low impact harvesting equipment and techniques within the project area, disturbance would likely be minimized and affect restricted areas within the total proposed project area.

Within all units, no temporary roads would be constructed. Trees would be whole-tree yarded to the landing, with residual logging slash and tops piled at the landing. Trees identified as snags or root-sprung general hazard trees along the roads would be felled and slash would be hand piled by the successful bidder and burned. Existing landings would be used, where available. However, due to the inconsistent distribution of down trees, new landings would be created, but kept to a minimum.

Following salvage activities, slash piles would be burned by Forest Service personnel.

The existing forest transportation system roads would be used to provide access to proposed treatment areas. Road maintenance, including surface protection and erosion control, would be performed on portions of system roads as needed for project implementation. A dust abatement plan would be included to control wind-caused erosion from road use. Halls Flat Well may provide a water source for dust abatement. National Forest System roads and non-paved county roads used for haul would receive pre-, during-, and post-haul maintenance.

### **Integrated Design Features (IDFs)**

The following Integrated Design Features (IDFs) are resource protection measures that are developed by specialists and would be incorporated as part of any action alternatives for the project. They are in addition to LRMP standards and guidelines. These IDFs are also included as

part of the proposed action for implementation parameters that would be incorporated into treatments, contracts, or used to guide Forest Service personnel in conducting implementation.

### **Threatened, Endangered, Sensitive (TES) Plant Species**

1. New occurrences of Threatened, Endangered, or Sensitive (TES) plant species discovered before or during ground-disturbing activities would be protected through flag-and-avoid methods.

### **Noxious Weeds**

2. All off-road equipment would be weed-free prior to entering the Forest. Staging of equipment would be done in weed-free areas.
3. Known noxious weed infestations would be identified, flagged where possible, and mapped for this project. Identified noxious weed sites within or adjacent to the project area containing isolated patches with small plant numbers would be treated (hand-pulled or dug) prior to project implementation. Any larger or un-pullable infestations would be avoided by harvesting equipment to prevent spreading weeds within the project.
4. New small infestations identified during project implementation would be evaluated and treated according to the species present and project constraints, and avoided by project activities. If larger infestations are identified, they would be isolated and avoided by equipment, or equipment used would be washed after leaving the infested area and before entering an uninfested area.
5. Post-project monitoring for implementation and effectiveness of weed treatments and control of new infestations would be conducted as soon as possible and for a period of two years after completion of the project.
6. If project implementation calls for mulches or fills, they would be certified weed-free.

### **Cultural Resources**

1. All cultural resources will be protected by employing Standard Resource Protection Measures (SRPM) as defined in the Regional Programmatic Agreement.
  1. Pursuant to section RPA Appendix E Approved Standard Protection Measures section 1.0:
    - 1.3 All historic properties within APEs shall be clearly delineated prior to implementing any associated activities that have the potential to affect historic properties.
1. Historic property boundaries shall be delineated with coded flagging and/or other effective marking.
2. Historic property location and boundary marking information shall be conveyed to appropriate Forest Service administrators or employees responsible for project implementation so that pertinent information can be incorporated into planning and implementation documents, contracts, and permits (e.g., clauses or stipulations in permits or contracts as needed).

1.4 When any changes in proposed activities are necessary to avoid historic properties (e.g., project modifications, redesign, or elimination; removing old or confusing project markings or engineering stakes within site boundaries; or revising maps or changing specifications), these changes shall be completed prior to initiating any project activities.

1.5 Monitoring by heritage program specialists may be used to enhance the effectiveness of protection measures. The results of any monitoring inspections shall be documented in cultural resources reports and the Infra database.

1. Standard Protection Measures from Regional PA Appendix E section 2.2 include,
  1. Felling and removal of hazard, salvage, and other trees within historic properties under the following conditions:
    1. Trees may be limbed or topped to prevent soil gouging during felling;
    2. Felled trees may be removed using only the following techniques: hand bucking, including use of chain saws, and hand carrying, rubber tired loader, crane/self-loader, helicopter, or other non-disturbing, HPM-approved methods;
    3. Equipment operators shall be briefed on the need to reduce ground disturbances (e.g., minimizing turns);
    4. No skidding nor tracked equipment shall be allowed within historic property boundaries; and
    5. Where monitoring is a condition of approval, its requirements or scheduling procedures should be included in the written approval.
2. If the District Archaeologist or Forest Archaeologist determines that hazard and salvage trees cannot be removed from within the cultural resource boundary without causing an adverse effect to the resource then work within the sites boundary will be limited to the following:
  - 1.2 Activities within historic property boundaries will be prohibited with the exception of using developed Forest transportation systems when the HPM or qualified heritage professional recommends that such use is consistent with the terms and purposes of this agreement, where limited activities approved by the HPM or qualified heritage professional will not have an adverse effect on historic properties,
3. Linear sites such as historic roads may be crossed on a limited basis in previously disturbed areas. All crossings shall be made perpendicular to the site, and the site shall be returned to its original design at project completion. All crossings shall be designated by heritage personnel and conform to the following:

2.1 The following historic property protection measures may be approved for undertakings under the conditions detailed below:

1. Linear sites (e.g., historic trails, roads, railroad grades, ditches) may be crossed or breached by equipment in areas where their features or characteristics clearly lack historic integrity (i.e., where those portions do not contribute to site eligibility or values).
1. Crossings are not to be made at the points of origin, intersection, or terminus of linear site features.
2. Crossings are to be made perpendicular to linear site features.
3. The number of crossings is to be minimized by project and amongst multiple projects in the same general location.
4. The remainder of the linear site is to be avoided, and traffic is to be clearly routed through designated crossings.
5. Work may take place within site boundaries if the following protection measures are used:

RPA 2.1(b) Accumulation of sufficient snow over archaeological deposits or historic features to prevent surface and subsurface impacts. Undertaking activities may be implemented over snow cover on historic properties under the following conditions:

1. The cover must have at least 12 inches depth of compacted snow or ice throughout the duration of undertaking activities on sites.
1. In addition the following standard protection measures will be implemented:
  1. Hauling on main system roads that bisect archaeological sites would continue. Vehicles and equipment using these roads must stay on the road prism in areas that bisect heritage sites. New road construction, reconstruction, decommissioning or modification of the existing prism within site boundaries will not occur without additional review and/or consultation.
  2. Forest system spur roads and non-system roads that bisect archaeological sites shall not be used unless heritage properties have been evaluated and determined ineligible for the NHRP.
  3. Project manager or sale administrator shall be apprised of all site locations within the project APE before project implementation to insure protection.
  4. Historic properties within or adjacent to planned treatment areas, activity areas or roads shall be monitored during and after project completion.

## Wildlife

1. Limited operating period of February 15<sup>th</sup> – September 15<sup>th</sup> would restrict all treatment in any habitat considered to be suitable for Northern Goshawk (*Accipiter gentilis*) until surveys are conducted to Pacific Southwest Region-accepted protocol.
2. Retain all existing old down wood that is greater than 15 inches in diameter and at least 15 inches in length. In addition, retain an average of 1.5 large down logs per acre. Large

down woody debris is to be larger than 15 inches in diameter and greater than or equal to 15 foot sections.

3. Where available, retain at least three snags per acre. Snags to be retained are, the largest snags available and greater than 15 inches DBH. If there is a leaning or root-sprung tree in contact with a snag, the leaning tree and snag are to be avoided and not removed to maintain/enhance wildlife habitat.
4. Retain green snap top trees.
5. Protect all oaks 4 inches diameter breast height or greater from removal.

### **Hydrology**

1. RCAs would be flagged and avoided and locations displayed as control areas on contractor maps.
2. The crossing of an unnamed ephemeral wash accessing Unit 2 would be hardened with rock.

### **Soils**

1. All relevant Region 5 Best Management Practices (BMPs) would be followed (USDA, 2011).
2. Soil moisture conditions would be evaluated using Lassen National Forest Wet Weather Operations and Wet Weather Haul Agreements in order to protect soil resources.
3. Soils must be dry at 10-inches deep before equipment can be operated.
4. Any soil ripping would be approved by a qualified specialist.
5. Aerial extent of detrimental soil disturbance (includes both compaction and displacement) would not exceed 15 percent of the area dedicated to growing vegetation. Soil porosity would be at least 90 percent of undisturbed conditions.
6. Following implementation, the project site would be evaluated by a qualified specialist to determine if detrimentally compacted ground exceeds the LRMP standard of 15 percent areal extent (as required above). If restoration were needed to achieve compliance an appropriate subsoiler, ripper or other implement would be used to fracture the soil in place, leaving it loose and friable. Landings no longer needed for long-term management would be remediated, as described.
7. To the extent possible, existing landings and skid trails would be utilized.
8. Where available, five logs per acre would be retained. When possible, these would represent a range of decomposition classes. This may include the 1.5 logs retained on the landscape for wildlife habitat.
9. Where available, enough litter and duff would be retained in order to provide at least 50 percent ground cover.
10. Activity-generate slash would be piled to minimize the amount of soil displaced into burn piles.



## **Fuels**

1. All pile burning would be conducted on permissive burn days, following Lassen County air quality regulations.
2. All residual slash on the landings would be piled and free of dirt to allow for the most consumption when burned.

## **Range**

1. Fences, water developments, and cattle guards would be protected. Repair of damage to structural range improvements, due to project activities, would be the responsibility of the contractor. Fence material would not be removed or damaged in the process of removing hazards and downed trees. If cutting of fence wire is required for project activities, coordination between the sale administrator and range specialist would be completed. Specific locations to open fences during operations would be identified to minimize necessary repairs.
2. Skidding or dragging of logs across fence wires would not be allowed in order to avoid snagging and pulling wires apart.

## **Alternative 2 – No Action**

Under the no action alternative, none of the activities proposed under the proposed action would be implemented. The no action alternative would not preclude activities already approved in this area or activities planned as separate projects. No salvage of windthrown material would occur within the project area.

Current management practices such as road maintenance and fire suppression would continue as per LRMP direction.

## **Chapter 3: Environmental Consequences**

This section describes the environmental impacts of the alternatives in relation to whether there may be significant environmental effects as described in 40 CFR 1508.27. The following documents are summarized in this EA (available upon request) and are hereby incorporated by reference into this assessment:

- Halls Flat Windthrow Project Socioeconomics Report; Danheiser, July 26, 2016
- Halls Flat Windthrow Project Fuels Report; Newby, May 31, 2016
- Biological Evaluation, MIS Report and Migratory Bird Report for the Halls Flat Windthrow Salvage Harvest; Rieffanaugh, July 26, 2016
- Biological Evaluation and Assessment for R5 Forest Service Sensitive and Federally Listed Plant Species Halls Flat Windthrow Project; Sanger, July 25, 2016
- Halls Flat Windthrow Project Hydrology & Soils Report; Wheelock, July 22, 2016
- Cultural Resources Report, Halls Flat Windthrow Project; Gassaway, June 6, 2016

Additional documents used for the Halls Flat Windthrow Project are also available upon request and are hereby incorporated by reference into this assessment, including the following:

- Migratory Landbird Conservation on the Lassen National Forest; Rieffanaugh, July 26, 2016
- Invasive Plant Species Risk Assessment Halls Flat Windthrow Project; Sanger, July 25, 2016
- Past, Ongoing, and Reasonably Foreseeable Future Actions Report for Halls Flat Windthrow Project; David, June 5, 2016

Further analysis and conclusions about the potential effects are available in the above reports and other supporting documentation located in the project record. The following sections are discussions of resources that have relevance to a determination of significance. The cumulative effects boundary for each resource was the Halls Flat Windthrow Project area, unless otherwise defined.

## **Socioeconomics**

This analysis is designed to provide a brief qualitative summary to identify the general application of economic and social evaluation that support the Forest Service planning and decision making process for the Halls Flat Windthrow Project. Multiple statutes, regulation and executive orders including the Multiple Use Sustained Yield Act, National Environmental Policy Act (NEPA) and Planning Act of 1974 identify the need to provide a general analysis of the social and economic analysis of the alternatives and relationships to the human environment. The following captures the effects from the of the deciding officials impact to socioeconomics pertaining to the project.

### **Direct and Indirect Effects to Socioeconomics**

#### **Alternative 1--Proposed Action**

Alternative 1 proposes the sale of approximately 443 CCF (hundred cubic feet) of saw timber within 280 acre sale area of approximately 1,497 analyzed acres; a value of roughly \$1,000. The direct effect of implementation of this alternative provides a positive socioeconomic impact to the forest products industry, its employees, and the local communities. Furthermore, the overall reduction in fuel is a benefit to local communities as well as federal governments both measurable fiscally and innate qualities of life.

Indirect effects result in the short lived success of the economic boom provided by the timber sale. The duration of this alternative will not create a sustainable local economy.

#### **Alternative 2--No Action**

Under a No Action alternative there will be no risk or gain to the local social or economic community.

### **Cumulative Effects to Socioeconomics**

#### **Alternative 1--Proposed Action**

Under Alternative 1, the cumulative economic effect of the Halls Flat Windthrow Project is the positive socioeconomic impact to the forest products industry, its employees, and local

communities. Such projects help to bolster this sector of the local economy which depends on federal timber to supply raw material needs. Affected industries include logging, primary wood-producing facilities and value-added industries such as furniture and homebuilding. These industries provide numerous job opportunities in the region. Additionally, people employed with the forest products industry purchase goods and services in the communities that they work and live in, supporting other small businesses such as restaurants, grocers, and supply stores. This is commonly referred to as the “multiplier effect”. Many of the communities in the southern Cascade and Sierra Nevada region rely heavily on the forest products industry.

The overall reduction in fuels would benefit local communities as well as local and federal governments.

### **Alternative 2--No Action**

Suppression costs generated in wildfires are often greater than the value of the timber resource lost. This loss, however, is not quantifiable when added to the intrinsic value of our natural resources.

## **Fire and Fuels**

There are several fuel models used to determine fuels and fire risk assessments for the project area. The two dominant existing Fuel Models are: Scott Burgan (SB) Fuel Model SB4 (204) (High Load Blowdown), and Fuel Model SB2 (202) Low Load Blowdown. The two aforementioned Fuel Models are used to determine no action, or existing conditions, fire behavior. Post-treatment or proposed action fuel models used are Timber Litter (TL) 1 (181) Low Load Compact Conifer Litter and Fuel Model TL3 (183) Moderate Load Conifer Litter. Slopes in the project area are generally 15% or less. Behave Plus 2005 would be used for the modeling of the project area pre- and post-treatment. Table 1 displays modeled fuel behavior of the proposed action, while Table 2 displays the production rates of fire suppression modules based on the proposed action. Tables 3 and 4 model the no action alternative.

## **Direct and Indirect Effects to Fire and Fuels**

### **Alternative 1--Proposed Action**

With the proposed action, (absent of extreme fire behavior) fire suppression could be achieved with district personnel based on crew production rates and the use of available resources. The harvesting of the windthrown material, though not classified as a surface fuels treatment, would greatly reduce fire intensity and residency time.

Table 1 depicts the projected fire behavior by fuel model, defined by flame length and rate of spread.

**Proposed Action/Desired Condition Table 1**

<b>Fuel Model</b>	<b>Flame Length</b>	<b>Rate of Spread*</b>
Fuel Model TL1 Post Treatment	.5 to 1 foot	1 to 2 chains /hour
Fuel Model TL3	1 to 2 feet	Up to 4 chains/hour

<b>Fuel Model</b>	<b>Flame Length</b>	<b>Rate of Spread*</b>
Post Treatment		

\* A chain is a unit of measure used to define 66 feet in length.

Table 2 depicts the production rate of modules available on the district in relationship to fuel model type, when modeled for the proposed action alternative.

**Hauling Chart (Line Production Rates) Table 2**

<b>Fuel Model Resources*</b>	<b>TL1</b>	<b>TL3</b>
<b>Engines</b>	24 chains/hr.	20 chains/hr.
<b>Crews</b>	20 chains/hr.	5 chains/hr.

\* Production rates are calculated based on individual rates of each individual per Module. Module calculations are based on a five-person engine (Engine rates are based on a scratch line, as well as using water.) and a ten-person hand crew

### **Air Quality**

Due to these acres being treated as part of the district's annual prescribed burn program and the fact they would be treated over a 2 to 4 year period, there would not be a difference in the effects on air quality. Depending on weather conditions and timing of other projects, it could take between 2 to 4 years to treat, following completion of the salvaging of the timber in place. Landing pile burning will take place in the fall. All burning would be conducted on permissive burn days and follow the constraints of Lassen County. The project area would be burned under conditions that are conducive to good dispersion of the smoke and would meet the emissions guidelines set forth by the state of California.

### **Alternative 2--No Action**

The no action alternative could result in increased wildfire and suppression cost. Abiotic effects, such as the air quality resource, would likely be adversely impacted in taking no action.

Table 3 depicts the projected fire behavior by fuel model defined by flame length and rate of spread.

**No Action/Current Condition Table 3**

<b>Fuel Model</b>	<b>Flame Length</b>	<b>Rate of Spread</b>
Fuel Model SB2 Pre-Treatment	10 to 11 Feet	37 to 39 chains/hour

<b>Fuel Model</b>	<b>Flame Length</b>	<b>Rate of Spread</b>
Fuel Model SB4 Pre-Treatment	20 to 22 Feet	132 to 134 chains/hour

Table 4 depicts the production rate of modules available on the district in relationship to fuel model type when modeled for the no action Alternative.

**Hauling Chart (Line Production Rates) Table 4**

<b>Fuel Models Resources</b>	<b>TL1</b>	<b>TL3</b>	<b>SB2</b>	<b>SB4</b>
<b>Engines</b>	24 chains/hr.	20 chains/hr.	20 chains/hr.	20 chains/hr.
<b>Crews</b>	20 chains/hr.	5 chains/hr.	10 chains/hr.	4 chains/hr.

## **Cumulative Effects to Fire and Fuels**

### **Alternative 1--Proposed Action**

Current conditions present an excess number of windthrown and root-sprung trees. This makes these areas more susceptible to fire. Large woody down material is more receptive to both short and long range spotting outside of the fire perimeter, thus creating a hazard to the immediate and down range areas.

Under the proposed action, these trees would be harvested and by doing so would lessen the chance of having a spotting issue. This would also cut down on suppression activity cost, in case of a fire in the project area or immediate area. As shown in the above tables, suppression activities could be completed with District resources.

The proposed action would also lessen the residency time of fire on the ground and lessen the fire severity. This would lessen the amount of damage to the project area soils and aquatic features, such as the numerous wet meadows within the project area. This would also equate to a quicker recovery time in case of a wildland fire event.

### **Air Quality**

Additional projects that could affect the air quality would be any harvesting or burning within the Bald Fire footprint, as identified in the PORFFA. These activities would include but not be limited to the harvesting and /or burning of landing and hand piles from two salvage sales being concurrently operated on. Any prescribed fire in the portions of the eastside of the Hat Creek R.D could also affect air quality.

Fugitive dust could result from logging operations, such as skidding and hauling during dry seasons. Contractual requirements for standard road watering procedure would mitigate much of the problem. There could also be fugitive dust from local residents recreating in the project area for firewood cutting and hunting.

## **Alternative 2--No Action**

Under the no action alternative, these trees would be left in place and no treatment would take place. This would increase the amount of current surface fuel loading. By doing so, it would increase fire risk with the additional fuel loading. The no action alternative would also hamper suppression activities if a wildland fire event was to happen, as the hauling charts show the large dead and down components slow production rates for crew and engines alike. With the fire activity that is generated from this fuel model, suppression cost goes up with the need for heavy equipment and the possible use of aircraft.

Under the no action alternative, there would be greater residency time of fire therefore increasing the severity. This would have more impact on the soils of the project area in case of a Wildland event.

## **Terrestrial and Aquatic Threatened, Endangered, Sensitive (TES) and MIS Species**

Due to the project area being outside the range of the species, or due to the lack of suitable habitat or habitat components in the project area, it has been determined that the proposed action would have no effect on the following federally proposed, listed threatened or endangered species, or their critical habitats: Gray wolf, northern spotted owl, valley elderberry beetle, and giant garter snake. Thus, these species will not be further discussed.

Due to the project area being outside the range of the species, or due to the lack of suitable habitat or habitat components in the project area, or because of mitigation measures, it has been determined that the proposed action would have no effect on the following Forest Service Sensitive species: California spotted owl, northern bald eagle, great gray owl, greater sandhill crane, willow flycatcher, California wolverine, Pacific fisher, American marten, Sierra Nevada red fox, Townsend's big-eared bat, and western bumblebee. Thus, these species will not be further discussed.

There is suitable habitat for the northern goshawk, pallid bat, and fringed myotis within the project area. The analyses for these species are summarized below from the Biological Evaluation (BE) for the proposed action.

## **Direct and Indirect Effects to Terrestrial TES Wildlife Species**

### **Northern Goshawk**

The northern goshawk habitat includes moderate to large diameter trees and nests in dense (greater than 70 percent CC) overstory canopy covers. The project area is comprised primarily of foraging habitat with very limited nesting habitat opportunities for northern goshawks. Two northern goshawk Protected Activity Centers (PACs) are located within or within 1/2 mile of the project area.

## **Alternative 1--Proposed Action**

There are two goshawk Protected Activity Centers (PACs) within 1/4 mile of the proposed project area (see Map 2). The project area itself represents minimal nesting and foraging habitat for northern goshawks. This species typically do not nest within one mile of another goshawk, so the

project area would not be expected to represent another nesting territory for either species, given the proximity of known nests, even if suitable habitat existed. The primary impacts would be noise related to the removal downed logs.

In order to meet objectives, the current project would remove the structural component of suitable habitat by removing down wood created by the windthrow events. The habitat is considered to provide moderate foraging for goshawks, although there is a suitable amount of continuous (greater than 10 acres) 4M – 6D habitat. All areas up to ¼ mile from the PACs would remain foraging habitat for northern goshawks, even though a small amount of structural integrity of the habitat would be removed in the form of downed logs. Overall, the project area is primarily suitable for foraging by wandering goshawks.

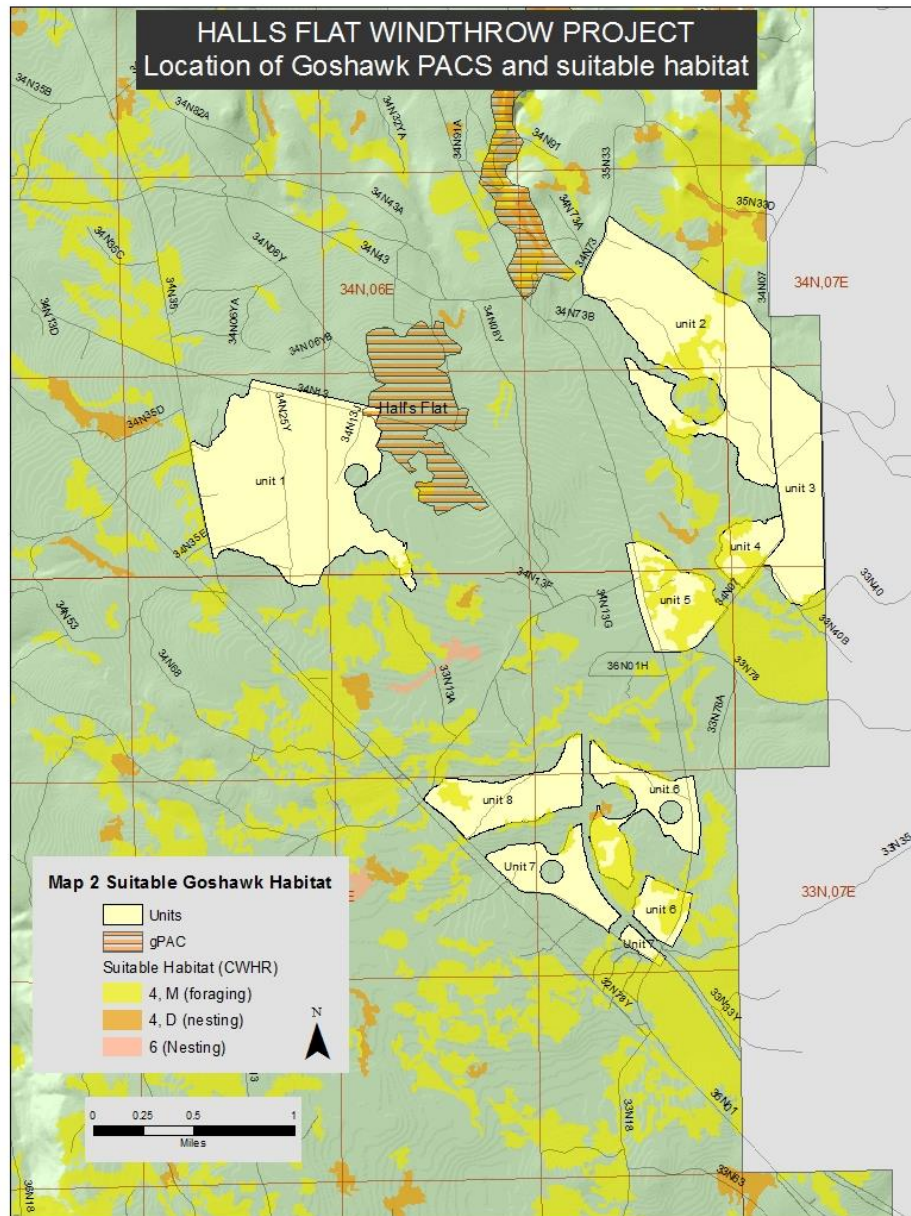
Understory vegetation would continue to thrive and provide habitat for ground squirrels, gray squirrels and some birds - prey items primarily for goshawks. The proposed project would not alter the overall existing status of corridors as foraging habitat for goshawks.

Post-fledging areas (PFAs) are areas surrounding goshawk nest locations that roughly correspond to the territory (defended area) of a goshawk pair (Reynolds et al 1992). The PFA represents an area of concentrated use by goshawk young from the time the young leave the nest until they are no longer dependent on the adults for provisioning (up to two months). PFAs provide hiding cover for the young as well as prey. Reynolds et al (1992) recommended 420 acre PFAs that encompassed the nest stands. The project footprint is within the 420 acres that are calculated for the two closest goshawk nests to the project, however given that treatment would be conducted after dispersal, there would be no effects to PFAs associated with these nests.

The project area would continue to provide foraging habitat. Over time, the existing trees would continue to grow and canopy closures would gradually increase if trees are allowed to grow. Given that the area is a managed road corridor with a lack of forest structure (snags, down wood, multistoried canopy cover), foraging habitat would likely continue to be the primary use by goshawks. There is more suitable habitat with greater structural diversity more conducive to nesting and foraging located elsewhere in the landscape within the network of PACs provided nearby. Therefore, foraging habitat would continue to be provided and would be the primary use of this area for goshawks.

Some disturbance to individuals or disruption of foraging patterns may occur during project implementation. However, an abundance of other foraging habitat exists, allowing individuals to easily find undisturbed sites.





**Map 2. Northern Goshawk PACs**

### **Alternative 2 – No Action**

There would be no direct impacts to the northern goshawk as a result of alternative 2. As a result of the retention of root-sprung trees, there might be an increase in down woody material available for plucking posts, and for prey species habitat, as stressed trees died, and once they have fallen.

### **Pallid Bat/Fringed Myotis**

Pallid bats have been recorded on the Lassen, but no maternity or hibernacula have been found. Pallid bats roost in caves, rock and cliff crevices, as well as in large snags or green trees with

loose peeling bark, which provide a roost structure such as a cavity or other deformity, and can be found in forested habitats including mixed-conifer forests. Primary prey species are large, terrestrial arthropods, such as scorpions, ground crickets and beetles (Hermanson and O'Shea 1983). Pallid bats have been found in lava tube caves on the Hat Creek Ranger District adjacent to project activities.

Fringed myotis individuals were trapped at several locations during District-wide bat surveys from 2001-2004 on the Eagle Lake Ranger District. Locations at which this species was recorded included sites within eastside pine forests and within mixed conifer forests. Trapping results indicate the species was not as numerous as other species encountered, but that fringed myotis were widely distributed across the District. Based on these results, fringed myotis could be present in low numbers within the project area. Fringed-tailed myotis are considered to feed predominantly on beetles and moths, with other items like spiders, flies, lacewings and leafhoppers also included. Consumption of prey may be a function of prey availability more than this bat species consistently selecting one type of insect over others (Verts and Carraway 1998).

### **Alternative 1--Proposed Action**

As discussed by Buchalsky et al (2013), observations of increased bat activity after disturbance (such as harvest of snags, thinning or prescribed fire) could be related to decreased amount of clutter in the forest canopy, increased abundance of insect prey, or increased quantity and/or quality of roost habitat as a result of trees killed or damaged by fire.

There are few snags of the type with peeling bark crevices affected by the proposed project. . Trees with peeling bark do not occur in travel corridors and power line areas, and any that were once present were removed as hazard trees. Most project salvage trees are live trees with intact bark that were uprooted during the wind event, or they have been downed. The primary potential for direct effects to both bats is disturbance to day roosting individuals during salvage operations. Fringed myotis are more sensitive to roost site disturbance (O'Farrell and Studier 1980). There is potential for the flushing of bats from roost trees as salvage operations occur adjacent to a roost snag.

The project area represents suitable foraging habitat for both species as roadsides are open habitat and the area contains numerous wet meadows and open woods that provide habitat for prey species. The maximum effect would be that there would be some disturbance to individuals or disruption of foraging patterns due to noise effects during project implementation. However, there is an abundance of other, undisturbed foraging and roosting habitat away from roads and cleared power line right of ways, and project activities would be of extremely short duration.

This action would overall not change current habitat condition for either species, as right of ways and road corridors are not managed for snags and trees that are roosting habitat for these species. Little immediate change would likely occur in the existing habitat values for this species. Foraging habitat throughout the proposed treatment areas would remain

### **Alternative 2--No Action**

There would be no impacts to these bat species as a result of alternative 2. As a result of the retention of root-sprung trees, there could be an increase in roosting habitat - as stressed trees die - until they fall.

## **Cumulative Effects to Terrestrial TES Wildlife Species**

### **Alternative 1--Proposed Action**

#### **Northern Goshawk**

The cumulative effects analysis area was kept within ½ mile of the project area, as the project is several small polygons of with limited disturbance, and most of the area is flat and wide open terrain. Past and foreseeable future projects are addressed in the Past, Ongoing, and Reasonably Foreseeable Actions Report for the proposed action (PORFFA).

The project analysis area has overlap with only two northern goshawk PACs and goshawk PFA. There is an extremely short term disturbance at each salvage site. Because of the wind event, stand conditions have been recently been altered to reduce tree density and fire resilience. The long-term effect of the proposed project would be to maintain the status quo within the project footprint. Being that no green trees are to be removed, snags and green snap top trees are to be retained and no canopy structure is to be altered, cumulatively there would be little long term effects associated with the other projects described in the PORFFA with effects as described herein for northern goshawks or their young.

#### **Pallid Bat/Fringed Myotis**

The established project area boundary was considered sufficient as a cumulative effects analysis area for both bats because, 1) no spatially-oriented standards and guidelines or LOPs are associated with this species, 2) pallid bats form maternity colonies and thus individuals do not have defined spatial territories that can be mapped or assessed, and, 3) there are no areas within or adjacent to the analysis area that represent unique habitat opportunities for these species that would warrant decreasing the project area. The proposed actions might remove roosting snags that are hazard trees that are beneficial to this species and would retain an open foraging habitat.

### **Alternative 2--No Action**

#### **Northern Goshawk**

There would be no impacts to the northern goshawk as a result of the no action alternative. As a result of the retention of root-sprung trees, there might be an increase in down trees for plucking posts, and for prey species habitat, as stressed trees died, and once they have fallen.

#### **Pallid Bat/Fringed Myotis**

There would be no impacts to bat species as a result of the no action alternative. As a result of the retention of root-sprung trees and green snap to trees the habitat there may be an increase in suitable roost trees.

## **Determination of Effects**

### **Northern Goshawk**

#### **Alternative 1--Proposed Action**

Given the above analyses, it has been determined that that the proposed project may affect individuals of northern goshawks, but is not likely to result in a trend towards federal listing or loss of species viability.

#### **Alternative 2--No Action**

There would be no impacts to the northern goshawk as a result of alternative 2. As a result of the retention of root-sprung trees, there might be an increase in down trees for plucking posts, and for prey species habitat, as stressed trees died, and once they have fallen.

### **Pallid Bat/Fringed Myotis**

#### **Alternative 1--Proposed Action**

It has been determined that the proposed activities within the Halls Flat Windthrow project may affect individuals of the fringed myotis and pallid bat, but is not likely to result in a trend towards federal listing or loss of species viability.

#### **Alternative 2--No Action**

There would be no impacts to bat species as a result of the no action alternative. As a result of the retention of root-sprung trees and green snap to trees, the habitat there may be an increase in suitable roost trees.

## **Sensitive and Listed (TES) Aquatics Species**

Due to the project area being outside the range of the species, or due to the lack of suitable habitat or habitat components in the project area (see Aquatics BE/BA for the proposed project for further information), it has been determined that the proposed action would have no effect on the following federally proposed, listed threatened, endangered, or candidate aquatic species, or their critical habitats: California red-legged frog, Sierra Nevada yellow-legged frog, Central Valley spring-run chinook salmon, Central Valley steelhead trout, Sacramento River winter-run chinook, Delta smelt, conservation fairy shrimp, vernal pool fairy shrimp, Shasta crayfish, and vernal pool tadpole shrimp.

Due to the project area being outside the range of the species, or due to the lack of suitable habitat or habitat components in the project area, or because of mitigation measures, it has been determined that the proposed action would have no effect on the following Forest Service sensitive species: black juga, nugget pebblesnail, California floater, Great Basin Ramshorn, scalloped jugatopaz juga, montane peaclam, kneecap lanx, Cascades frog, foothill yellow-legged frog, Goose Lake redband trout, Eagle Lake rainbow trout, hardhard, Pacific lamprey.

The Halls Flat Windthrow Project is located in dry, east side pine vegetation type dominated landscape of the Hat Creek Ranger District on the Butte Creek Rim. Water sources are limited in this area to intermittent streams and wet areas within unit boundaries that are defined by annual rainfall. Slopes in this area are gentle and do not exceed 35 percent. Water drainage south of unit

1 would flow toward Butte Rim and eventually drains down to the Butte Creek. North of all units, the water flow is northward towards the Pit River, miles from the project boundaries. Any overland water flow doesn't meet with any perennial water features within project area boundaries. See hydrology section of the EA for a more complete description of water features within the area.

All treatment units are in the upland and exclude any treatments in RCAs. There are no threatened, endangered, candidate or sensitive aquatic species recorded in the project area, nor downstream of the project area for at least 5 miles. There is no habitat for mollusks or fish in the form of permanent water features (creeks, lakes, ponds, wetlands) within the project area boundaries.

If water features are discovered during project activities, Riparian Conservation Areas (RCA) would be allocated along all perennial and seasonally flowing streams, lakes, ponds, and wetlands in accordance with the 2004 SNFPA FSEIS and ROD. Project activities would be excluded from these areas.

If needed, dust palliatives would be applied according to manufacturer's directions, and under direction of a project-specific Dust Abatement Plan to include a 25' no-treatment buffer surrounding waterways (creeks, lakes, ponds, wetlands).

Water drafting sites used for the project will meet BMPs. The Halls Flat water drafting site will be the Halls Flat well, located central to the project unit boundaries

All Best Management Practices (BMPs) would be implemented to meet water quality objectives and to maintain and improve the quality of surface waters on the Forest (LRMP-page 4-31). BMPs are described in Water Quality Management for Forest System Lands in California, Best Management Practices (2000).

### **Determination**

There will be no impacts or effects to aquatic species as a result of the Halls Flat Windthrow Project.

### **Management Indicator Species (MIS)**

The MIS whose habitat would be either directly or indirectly affected by the action alternatives of the Halls Flat Windthrow Project and that was analyzed in the MIS report is the mountain quail. Summary of the analysis of potential effects of the action alternative on analyzed MIS species and their habitats are provided below.

There are no aquatic MIS species affected by the proposed action because there is no flowing water or ponds within or adjacent to the project units (see aquatic species section and hydrology report section of this document).

### **Direct and Indirect Effects to Terrestrial MIS**

#### **Alternative 1--Proposed Action**

All acres would remain in current status (size, class, and density), resulting in no net reduction and therefore the habitat would remain for the mountain quail. The recent windthrow event caused a reduction in stand class by reducing stand density. As a result of the proposed action

canopy closure, tree size and CWHR class would remain the same to that prior of treatment. Results would be limited to the removal of large down woody debris.

Between early and mid-seral habitats (a total of 1497 existing acres), there would be no net loss in these areas as a result of implementing the proposed action. Overall, the change would be very minimal and early and mid-seral stage habitat for the quail would remain the same. Over the long term (20 years), habitat would remain the same relative to the development of the current condition.

There would be an immediate decrease in surface fuels as a result of the proposed action. Thus, about 1497 acres would become more resilient to wildlife. Over time, some of this area may recover as understory shrub alongside areas of windthrow, allowing for more sun to reach the understory. Mountain quail utilize understory shrub habitat as hiding and thermal cover, so this habitat might be less suitable until some understory shrub cover recovers.

### **Alternative 2--No Action**

There would be no non-wildfire-related direct effects to mountain quail, but if no action was taken and a wildfire occurred in the area, there would be greater risk of the habitat being catastrophically burned. Tree structure would remain current and the same to that of the proposed action. Growth of stands over time would be the same as that of the proposed action. Overall, there would be an increase in as ground fuels as more root-sprung and stressed trees die and fall and stand density and structure would remain the same with higher surface fuel loads, resulting in a less suitable foraging habitat for mountain quail. Hiding and thermal cover would remain.

## **Cumulative Effects to MIS**

### **Alternative 1--Proposed Action**

Activities that contribute long-term to habitat loss for mountain quail include past thinning and salvage activities. For mountain quail, the entire project area is comprised of habitat. Much of this habitat is in plantations, which over time has resulted in an increase to early seral habitat, converted from brushfields. Due to the poor nature of the soils, most of these plantations have not grown beyond the size 4 CWHR class of tree and over time, have remained mountain quail habitat. Project activities would not contribute to the total cumulative change of mountain quail habitat in this area a result of past activities, particularly thinning and other salvage sales. Foraging opportunities would remain, as the removal of large down woody debris would allow for the growth of forbs and herbaceous vegetation. There would no cumulative effects as a result of the action, as there would be no change in the in the suitable acres in the project area.

### **Alternative 2--No Action**

The types of cumulative effects as a result of the no action alternative would be the same as identified for the proposed action. In 20 years, 100 acres would be lost as mid-seral habitat becomes late-seral habitat. This small change in acres would not contribute overall to loss of mountain quail habitat.

## Botanical Resources

### Direct and Indirect and Cumulative Effects to Botanical Resources

#### Alternative 1--Proposed Action

There are no known occurrences of Region 5 Sensitive plant species within the project area, nor does the project area have suitable habitat for any of these species. Therefore, there would be no direct, indirect, or cumulative effects from implementation of the Halls Flat Windthrow Project to any Region 5 Sensitive plant species.

#### Alternative 2--No Action

There are no known occurrences of Region 5 Sensitive plant species within the project area, nor does the project area have suitable habitat for any of these species. Therefore, there would be no direct, indirect, or cumulative effects from the no action alternative to any Region 5 Sensitive plant species.

### Determination of Effects

With implementation of Integrated Design Features, there would be no effect to any Threatened, Endangered or Forest Service Sensitive plant species within the Halls Flat Project because there are no known occurrences nor suitable habitat for any of these species.

## Hydrology

### Direct and Indirect Effects to Hydrology

#### Alternative 1--Proposed Action

Since there are no hydrologic features present in the project area, no direct effects would occur. There are no streams in the project area. Those close by are seasonal washes with small gradients, and therefore would only be subject to slow flows, which do not generally entrain sediment and damage channels. There would be no direct effects to streambank stability from the proposed action, as there are no operations occurring in RCAs. One of the primary ways to protect water quality is to minimize the quantity and speed of runoff. Since there are no hydrologic features in the project area, water quality would only be affected if flashy surface flows occurred, transporting sediment into seasonally active channels.

Indirectly, the reduction of down fuels would reduce the intensity of future wildfires. While low intensity wildfires have a lower potential of damaging watersheds, large, stand-replacing fires cause major, widespread damage. When vegetative cover is stripped away due to wildfire, soils can become hydrophobic, causing significant damage from surficial flow, even in flat areas.

#### Alternative 2--No Action

There would be no direct effects from the no action alternative, as no actions would be authorized under it.



Indirect effects would be caused by the increased likelihood of high intensity fire in the no action alternative. Without the reduction of fuel, continuous, heavy fuel load would increase the probability of a high intensity wildfire occurring. The increased intensity of a fire would likely remove groundcover, thereby adversely affecting hydrology, as well as increasing the likelihood of sediment loading in seasonal channels and wet meadow systems.,

## Cumulative Effects to Hydrology

### Alternative 1--Proposed Action

The table below shows the changes in the ERA model with the addition of removing the downed logs and underburning the units as a part of reasonably foreseeable future fuels activities. All the treatment units are in the upland and exclude any treatments in the RCAs. Negro Camp Gulch and Upper Beaver Creek are over TOC threshold from the Bald fire. However, erosion created by the proposed treatment units would add less than 0.5% to the total percent ERA. Given the small amount of area to receive treatment and the fact that they are all in the uplands and high in the watershed, these treatments would not be expected to affect the hydrologic conditions within the project area or downstream.

**Table 5. Percent ERA for the No Action and Action Alternatives**

HUC-12 Watershed	Watershed Acres	ERA Threshold	%ERA No Action Alternative	% ERA Addition from Proposed Action	ERA after Proposed Action
Bald Mountain Reservoir	35908	18	6.1	0.07	<b>6.2</b>
Lower Butte:	15959	14	3.7	0.09	<b>3.8</b>
Lost Creek	23770	14	6.0	0.27	<b>6.3</b>
Negro Camp Gulch	13682	18	34.5	0.05	<b>34.6</b>
Upper Beaver Creek	31209	18	18.3	0.37	<b>18.7</b>

### Alternative 2--No Action

The percent of the TOC is shown in Table 5, under the column notated *%ERA No Action Alternative*. Note that even with no actions occurring, Negro Camp Gulch and Upper Beaver Creek watersheds would still be over TOC, as a result of damage from the Bald Fire.

## Soils

### Direct and Indirect Effects to Soils

Soil parent materials in the project activity areas are almost completely basaltic. Soils and underlying rock are generally porous, causing precipitation to percolate deeply rather than contribute to streamflow.

Hydrologic soil groups (HSGs) are used to estimate runoff from precipitation. Soils are assigned to one of four groups ranging from low to high runoff potential. The soils in the Project Area are all classified as HSG B, which corresponds to *moderately low runoff* potential. According to the Lassen National Forest Soil Survey, “Free water lies on the surface for long periods or enters immediately into the soil. Velocity is such that erosion by runoff would be minimal.” In this case, even when heavy rains are occurring, runoff would not be flashy and the resulting erosion minimal.

The windthrow event downed many trees, so the Halls Flat Project landscape has a preponderance of large woody material. The number of down logs would increase as trees that were weakened in the event fall to the ground in the future. This down woody material would retain soil moisture and provide for the formation of additional topsoils in the future.

### Alternative 1--Proposed Action

#### Effects Related to Compaction

The risk of compaction is highest where the soil has elevated clay percentages. Compacted soils can often become bare as vegetative roots are unable to penetrate into the soil surface and re-establish vegetative cover. The lack of effective cover increases the potential of runoff. Soil erosion and impaired hydrologic function have a general potential to create indirect effects. Indirect effects of erosion and compaction are off-site effects upon watershed hydrology and/or water quality. Damaged soil hydrologic function, via compaction, could lead to increased runoff, which could affect the quantity, timing, and flashiness of stream flows during precipitation events.

Mechanical treatments, in general, have the potential to cause detrimental levels of compaction. Little compaction is anticipated, except where machine traffic is highly concentrated such as landings and primary skid trails. Soil monitoring in the project area showed little detrimental porosity loss where mechanical harvest had taken place in the last 30 years. Therefore, porosity loss would be expected to be kept within standards.

#### Effects Related to Mechanized Equipment

Low-impact harvesting techniques have less chance of moving soil into burn piles, keeping more effective ground cover in place. Thus, this method would be less likely to cause compaction. Therefore, a deficit of ground cover would not be anticipated.

Soil organic matter would be largely unaffected by displacement associated with tractor yarding because the existing trail system would be used. The risk would be further reduced by using Low-impact harvesting techniques. However, though often superficial (top 2-3 inches),

temperatures generated in burn piles can cause loss of soil organic matter, water holding capacity, and diminish the rate in which these areas become re-vegetated.

### **Effects on Large Woody Debris**

Large woody debris, though devoid in some portions of the project area, would likely see accumulation as trees left weakened or root-sprung begin to fail. This additional recruitment of woody debris creates not only potential habitat for wildlife, but increase nutrient cycling on the forest floor. This process of recruitment further aids in the long term development of soil and increases both biotic and abiotic processes, such as minimizing soil erosion by creating soil stability as areas become revegetated.

As discussed, the adverse direct effects associated with the proposed activities are expected to be mitigated by use of IDFs protecting both soils and hydrology, so indirect effects would be accordingly minimal.

### **Alternative 2--No Action**

There would be no direct effects from the no action alternative, as no actions would be authorized under it.

Without the reduction of fuel loading which would occur in the Proposed Action, there might be indirect effects. The continuous, heavy fuel load would increase the probability of a wildfire occurring. If a fire started in the area, the more continuous, untreated fuels would lead to higher potential for it to grow into a large fire. The increased intensity of a fire would likely remove groundcover, thereby adversely affecting soils and, potentially, nearby seasonal channels by increasing the potential for erosion. Furthermore, in moderate to high intensity fires in Eastside Pine areas, soils will usually become hydrophobic from the incorporation of volatilized resins from the trees. This, in turn, also results in increased erosion.

## **Cumulative Effects to Soils**

### **Alternative 1--Proposed Action**

Based on limited field observations and the PORFFA report, past projects have left some degree of persistent porosity loss (compaction). The adverse effects of the proposed action would be expected to be minimal, due to Integrated Design Features that would minimize the detrimental compaction expected in small areas and remediate areas that may exceed the LRMP standard.

In improving soil cover for areas currently lacking it, there would likely be a moderate short-term benefit in reducing overall erosion potential within the project area, while soil productivity and hydrologic function are maintained.

The proposed action would maintain soil productivity and function within required standards. Therefore, the proposed action, in combination with past, ongoing, and reasonably foreseeable future actions would not produce adverse cumulative effects to the soil resource.

### **Alternative 2--No Action**

There would be no cumulative impacts as a result of no action.

## Cultural Resources

### Direct and Indirect Effects to Cultural Resources

#### Alternative 1--Proposed Action

Sixteen cultural resource sites have been identified within the APE of the Halls Flat project. The proposed alternative, through the Integrated Design Features stated previously in this EA. These IDFs are standard resource protection measures, prescribed in the Programmatic Agreement among the U.S.D.A. Forest Service, Pacific Southwest Region (Region 5), California State Historic Preservation Officer, Nevada State Historic Preservation Officer, and the Advisory Council on Historic Preservation Regarding the Processes for Compliance with Section 106 of the National Historic Preservation Act for Management of Historic Properties by the National Forests of the Pacific Southwest Region. Alternative 1 would have no direct effect to historic properties upon implementation of IDFs protection measures discussed in this document.

The indirect effects of the proposed action would be the removal of windthrown and hazard trees, generally beneficial to historic properties by reducing the potential for high intensity and long duration fire effects on cultural resources. The removal of hazard trees reduces the potential for root failure to displace artifacts and/or cultural resources to be adversely impacted from tree fall impacting features and/or artifacts.

#### Alternative 2--No Action

There would be no direct effects from no action alternative.

The no action alternative would have an indirect effect of increasing the potential for wildfire to adversely impact cultural resources from logs burning with long residence times and high temperatures. Hazard trees created during the wind event also create the potential for root failure to displace artifacts and/or cultural resources to be adversely impacted from tree fall impacting features and/or artifacts.

### Cumulative Effects to Cultural Resources

#### Alternative 1 and Alternative 2--Proposed Action and No Action

There would be no cumulative effects for Cultural Resources. There would be no proposed or reasonably foreseen future actions to sites within the project's area of potential effect.

## Agencies and Persons Consulted

The Forest Service consulted the following individuals, Federal, State, tribal, and local agencies during the development of this environmental assessment:

#### Federal, State, and Local Agencies:

Shasta County Board of Supervisors

Lassen Board of Supervisors

Lassen County Fire Safe Council

Hat Creek Valley Fire Safe Council

Shasta County Fire Safe Council

Central Valley Regional Water Quality Control Board

Lahontan Regional Water Quality Control Board

California Department of Forestry and Fire Protection

California Department of Fish and Game

Natural Resource Conservation Service

**Tribes:**

Pit River Tribe

Greenville Rancheria

Susanville Indian Rancheria

**Others:**

Lassen Forest Preservation Group

Sierra Forest Legacy

American Forest Resource Council

Sierra Pacific Industries

## References

References for the Halls Flat Windthrow Project are found in the specialists reports for the project and are incorporated by reference in this environmental assessment. The specialist reports are available at the Hat Creek Ranger District Office in Fall River Mill, CA.